NATIONAL ECOLOGICAL OBSERVATORY NETWORK: OPERATIONS AND OPPORTUNITIES

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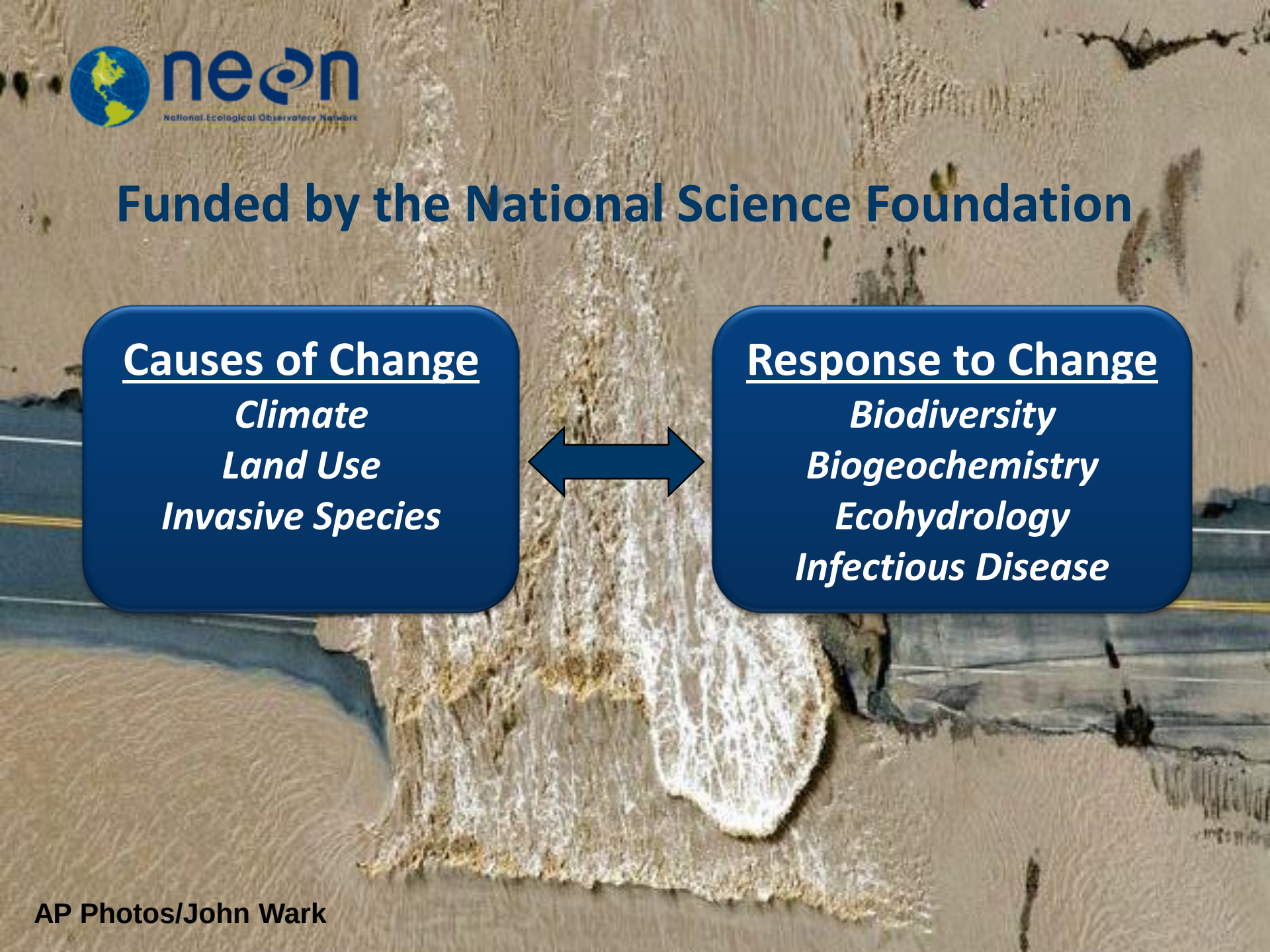
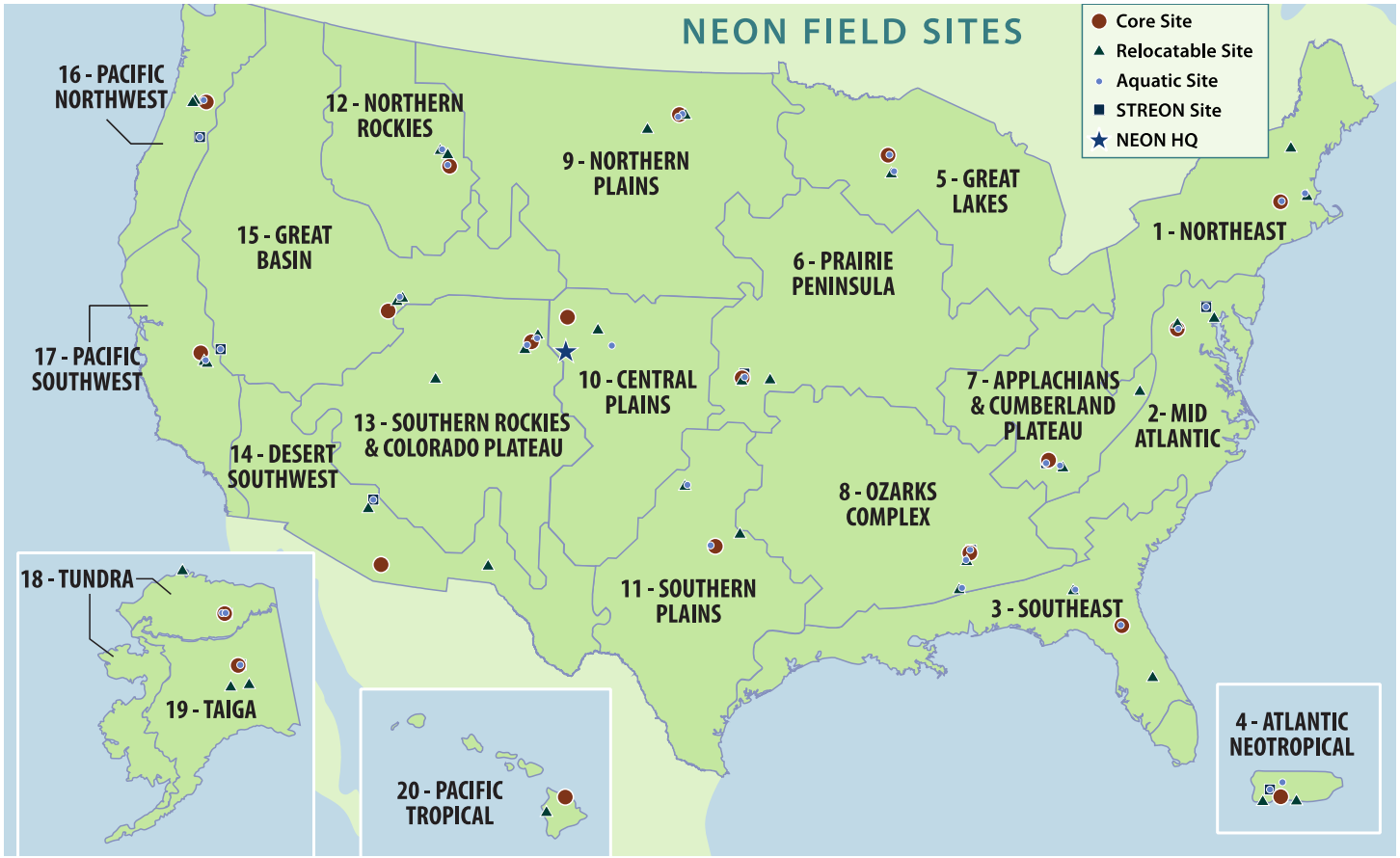

neon
National Ecological Observatory Network
Funded by the National Science Foundation
Causes of Change
Climate
Land Use
Invasive Species
Response to Change
Biodiversity
Biogeochemistry
Ecohydrology
Infectious Disease
AP Photos/John Wark

Intro to NEON: A Continental-Scale Design



1. **Core sites (20):** Located in unmanaged wildland conditions.
2. **Relocatable sites (40):** Representative of human land management effects on ecosystems
3. **Aquatic sites (36):** Measure changes in aquatic systems over time

Timeline

- 32 Towers built – >=10 in construction
- Field sampling at 13 sites in 2014; >=30 sites in 2015

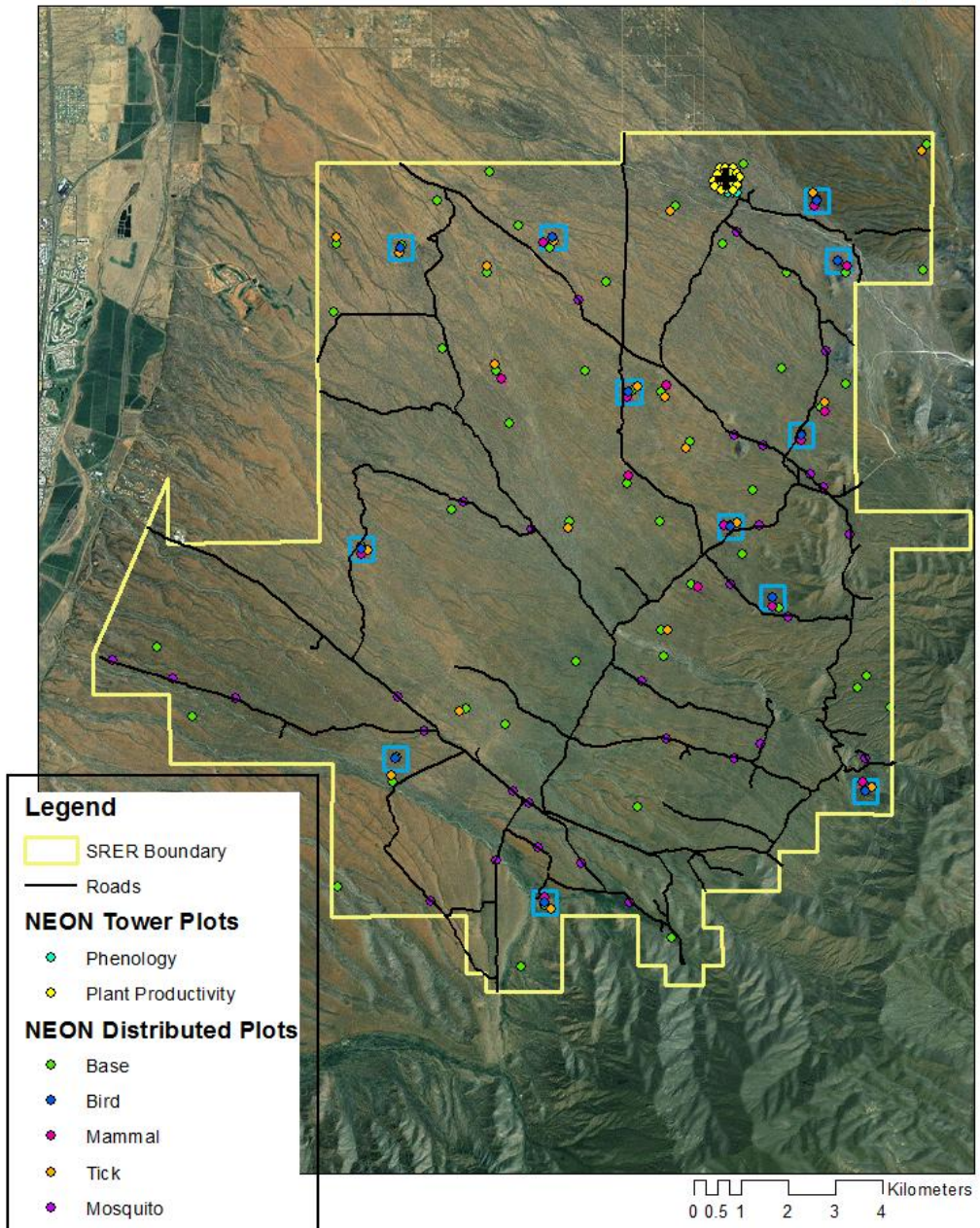
NEON Data

1. Biogeochemistry
2. Land use and land cover
3. Ecohydrology
4. Atmosphere
5. Organisms, populations, and communities

NEON Data

1. Diverse
2. Collocated
3. Standardized
4. Reproducible
5. Field + Lab
6. Includes:
    - Quality flags
    - Uncertainty

NEON's Terrestrial Plot Locations



NEON Integrated Sampling Strategy

Terrestrial Sampling (TOS)

Ticks

Mosquitoes

Small mammals

Phenology
Diversity
Abundance
Function
Pathogens
Productivity
Biomass

Ground beetles

Birds

Plants

Soil microbes

Biogeochemistry

Pools/fluxes:
Soils, plants, small mammals

NEON Integrated Sampling Strategy

Aquatic Sampling

Sensor measurements

- In-stream/In-lake
- Groundwater
- Underwater PAR
- Temperature
- Flow rate, Depth

Field Sampling

- Biogeochemistry
- Biological diversity
  - Microbes
  - Algae
  - Aquatic Plants
  - Invertebrates
  - Fish
- Morphology, Bathymetry

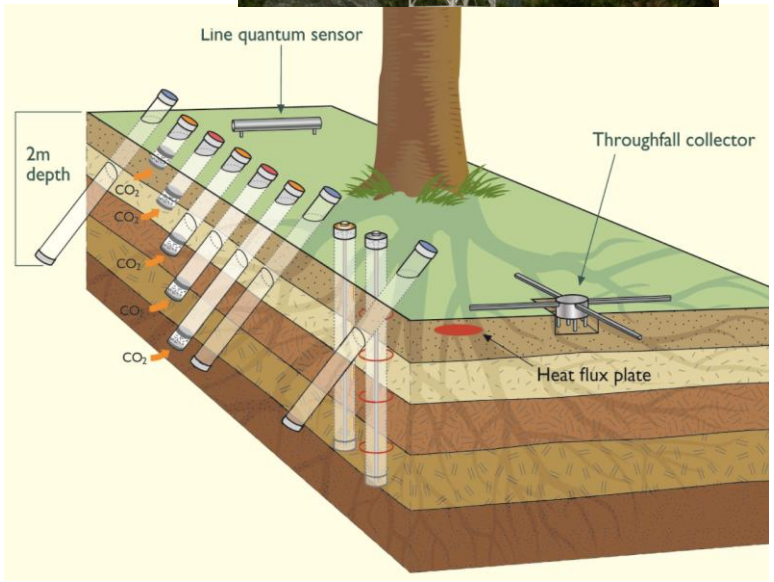
NEON Integrated Sampling Strategy

Atmospheric Measurements

- Key climate inputs
- Bioclimatic variables
- Chemical climate inputs
- Carbon cycle changes
- Water & energy balance

Soil Measurements

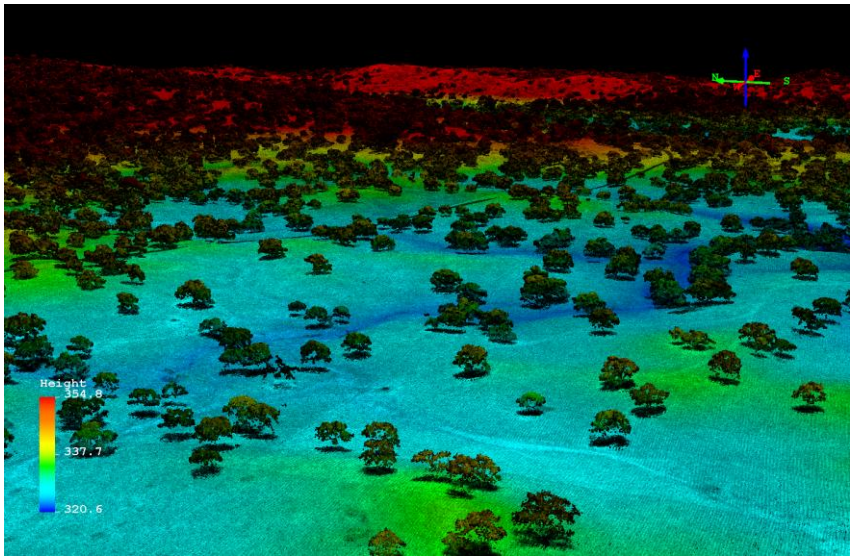
- Temperature
- Moisture
- CO_2
- Heat flux
- Root growth and phenology



NEON Integrated Sampling Strategy

Airborne Observations (AOP)

- Canopy chemistry
- Canopy moisture
- Leaf area
- Canopy structure
- Canopy height
- Land cover
- Diversity
- Disturbance

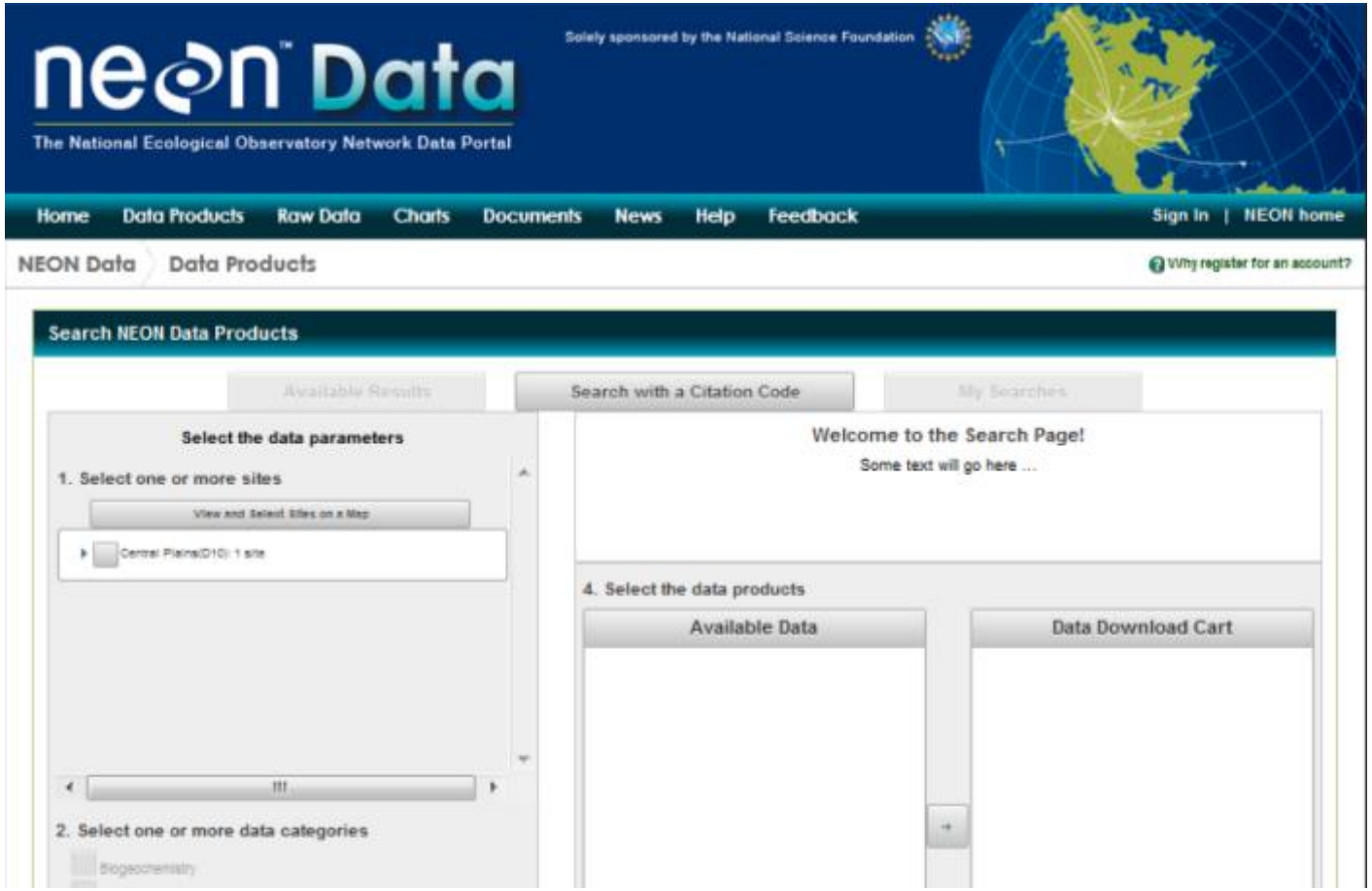


Instruments:

- LiDAR
- hi-res digital camera
- visible to shortwave infrared imaging spectrometer

Open science

data.neoninc.org



Archived Collections

Aquatic
Aquatic microbes
Periphyton
Phytoplankton
Macroalgae
Bryophytes / macrophytes
Benthic macroinvertebrates
Zooplankton

Terrestrial
Beetles
Mosquitoes
Plants
Small Mammal Tissues
Soil Microbes
Soil Archive

The Many Ways to Use NEON

The Many Ways to Use NEON

Infrastructure for the scientific community

Site-based

Mobile

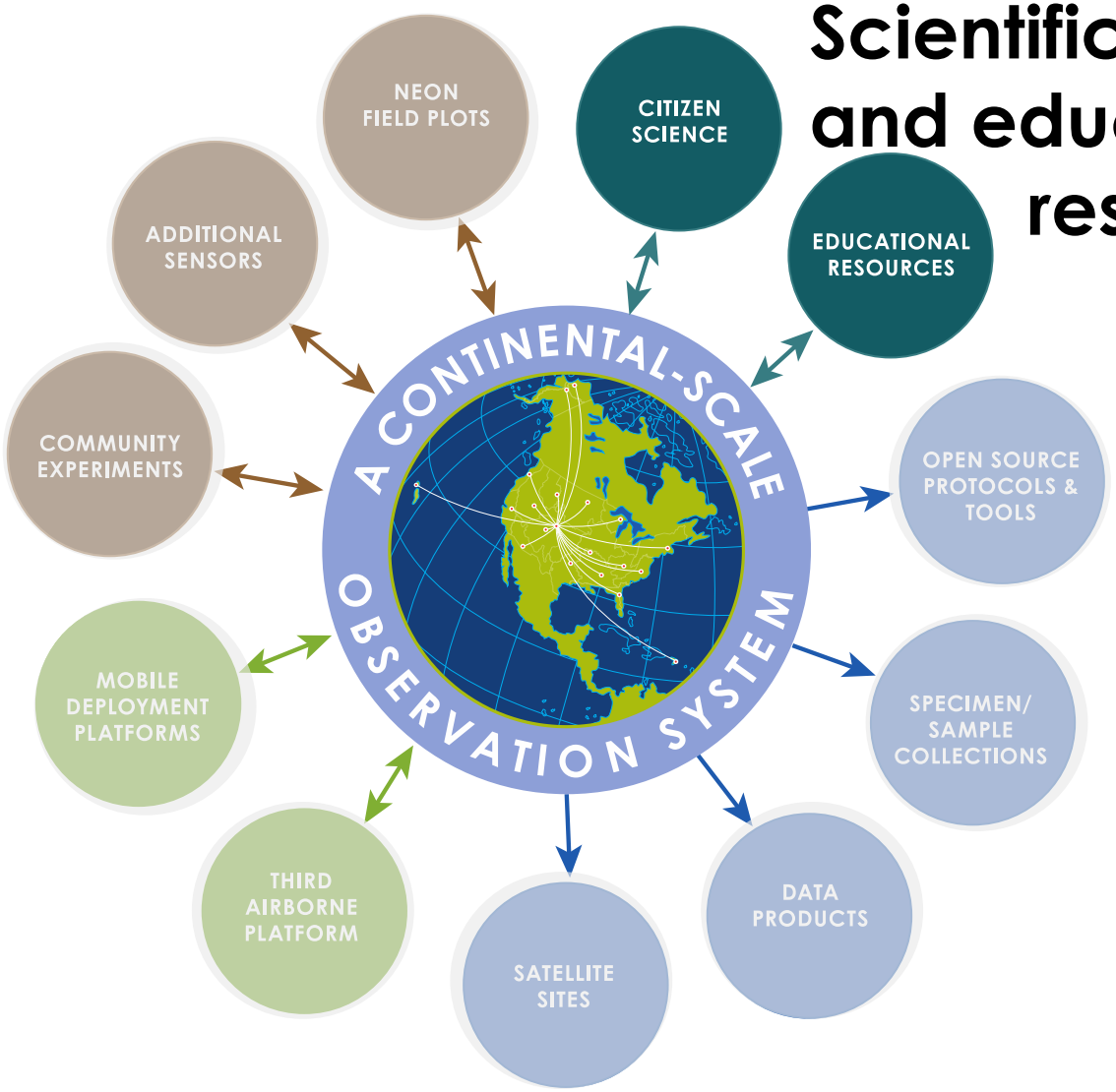
Mobile Deployment Platforms

http://kenmalgren.com/Blog/?tag=wildfire

Airborne Observation Platform

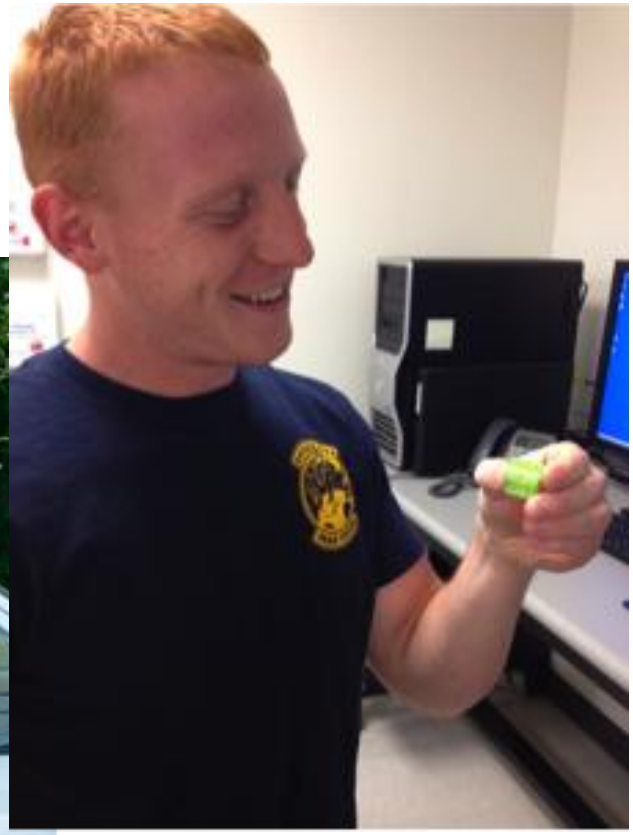
AOP-3
Earliest availability: Dec 2016

The Many Ways to Use NEON



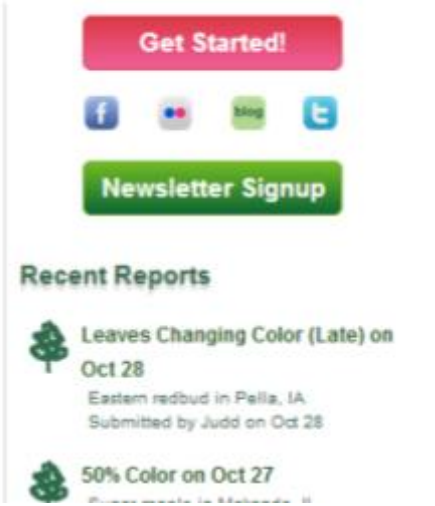
Scientific outreach and educational resources

NEON undergraduate internships



Project BudBurst

Budburst.org



The Many Ways to Use NEON

NEON serves as infrastructure for the community to conduct continental-scale research and experiments.

Continental-scale ecology-focused resources and programs will be available to engage the general public, educators and students.

Additional relocatable sensor platforms and one airborne platform will be available for the community to deploy.

All NEON data, protocols and samples will be freely available via the NEON web portal and specimen archives.

The National Ecological Observatory Network is a project sponsored by the National Science Foundation and managed under cooperative agreement by NEON Inc.

Photo: Thinkstock

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National Ecological Observatory Network

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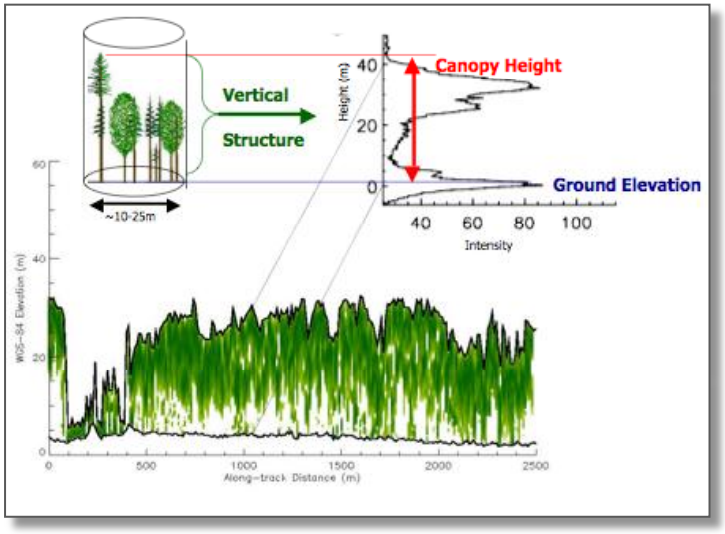
Airborne Data



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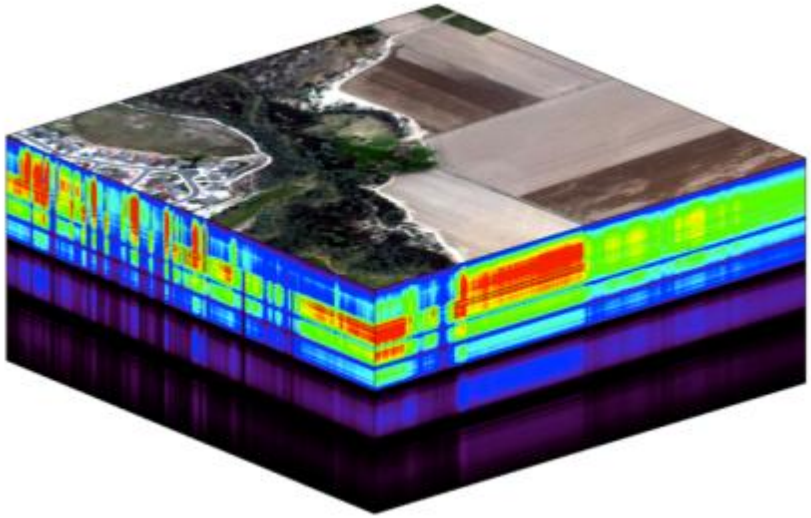
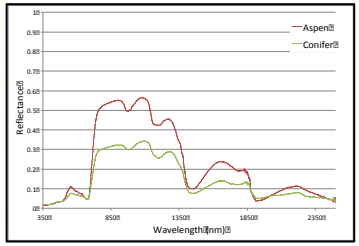
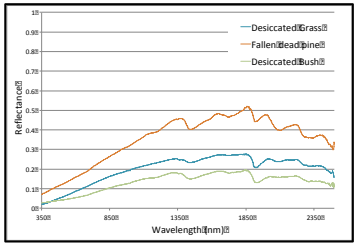


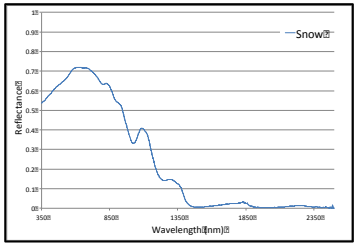
Algorithm development to accurately locate and determine characteristics of each pixel



Aspen & Pine



Dead Grass



Snow